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COVID-19: The Future of African Development Systems

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AfCFTA	African Continental Free Trade Agreement
COVID-19	Coronavirus
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
IFs	International Futures
ILO	International Labor Organization
IMF	International Monetary Fund
UNECA	United Nations Economic Commission for Africa
WHO	World Health Organization

FOREWORD

Africa's economic growth and development trajectory had been on a steady rise prior to the onset of the coronavirus (COVID-19). Since the World Health Organization (WHO) declared COVID-19 a global pandemic, African countries response followed the global trend of imposing economic shutdowns and limiting human movements to mitigate the effects of the virus on the population, especially the most vulnerable.

Shutdown measures have had a positive effect in mitigating the rapid spread of COVID-19. Equally, other fiscal measures put in place to cushion vulnerable populations and fragile economies have minimized the economic and social costs generated by the pandemic. However, COVID-19 has revealed important structural weaknesses and fragilities in African economic policies and structures along with the health systems that have and will continue to adversely affect the continent. With widespread poverty, large portions of urban population leaving in overcrowded informal settlements, and limited access to healthcare, many people will indirectly and directly be affected by COVID-19. Further, it seems the pandemic will reverse much of the recent developmental gains that the continent experienced thus increasing poverty and inequality.

Nonetheless, the ensuing negative effects of the pandemic force us to re-evaluate our development paradigm and use myriad tools and techniques at our disposal to re-examine the effectiveness and deficiencies of our policies and frameworks. Indeed, COVID-19 gives us fresh impetus to better understand and, re-engineer our development priorities to develop 'resilient' measures that not only withstand such shocks, but also, in the 'new normal' lead to policies that are truly sensitive and respond to the developmental aspirations of the people of Africa as espoused in Agenda 2030 and 2063. Global health, and certainly our socio-economic models, will never be the same after COVID-19. They cannot be. We must emerge, post COVID-19, with greatest possible resilience of the continent in the face of the challenges generated by the pandemic and future crisis. It must be business unusual.

Whereas the pandemic is a momentous threat, we should view this as an opportunity to reimagine the challenges faced by the continent for inclusive economic and social development. It is evidently clear from this crisis that health, social and economic issues are interrelated, interdependent and interconnected. To better understand these complex 'systems' we need to evaluate these relationships keenly. Thinking in a systems map framework allows us to better understand dynamics associated with groups of meaningfully interconnected variables and units, in this instance health, social and economic issues.

It is my hope therefore that in interrogating the complex relationships between these variables within the context of COVID-19, by employing 'systems map' approach, policy makers and Member States, will understand and appreciate the relationships and dynamics better. In turn, they will be able to determine policies, institutions, and structures that have 'failed' and equally adjustment or create new ones. The latter will require that we reimagine and re-engineer our institutions and frameworks to formulate new policies that can lead to resilient economies and societies.

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EXECUTIVE SUMMARY

The spread of COVID-19 is a global pandemic that has changed how humans live, produce, interact, and communicate. It has reached into all aspects of life and created great uncertainty, intensifying the vulnerability of struggling populations, and challenging the legitimacy of governments, creating a shared human experience that stretches around the world. The long-term effects of this pandemic will be felt for our lifetime.

This report introduces a framework to aid decision-makers in thinking about the long-term effects of COVID-19 on development and pursuit of Agenda 2063. We do this by pursuing types of inter-related research. First, we create a systems framework for understanding how COVID-19 is unfolding and interacting with different aspects of governance and development. Second, we create two alternative scenarios within the International Futures modeling platform that assess the long-term effects of COVID-19 on human development trajectories in light of previous work analyzing *Choice in the Face of Great Transformation.*

We find that COVID-19 has particular impacts on vulnerable populations and that these must be the focus of the policy response. For example, scientific literature makes clear that older populations or those with high co-morbidities are more vulnerable to the disease. These groups of people should be protected as a policy priority. Longer-term policy should address countries that are more dependent on food imports for consumption as broader systemic disruptions in food production can weaken food and nutrition security. Countries with dependence on imports and exports from countries that have been hard-hit by COVID-19 will also experience economic downturns that will be disruptive. The continent should prioritize a strategy of "managed interdependence" that evaluates which policies will mitigate the risk of economic dependence on the outside world and highlight internal economic resilience. Additionally, countries with weak governance institutions that cannot rapidly respond to changing citizen demands in the face of this global pandemic will be more vulnerable to the spread and socio-economic effects of the virus.

The economic effects of COVID-19 will be significant. COVID-19 reduces African economic output in 2020 by USD192 billion. Scenarios with greater or lesser economic effects range from -USD150 to -USD234 billion in 2020. Moving forward, the cumulative economic reduction is USD2.8 trillion by 2030, USD8.9 trillion by 2040 and USD19.9 trillion by 2050. In more pessimistic scenarios the cumulative reduction in GDP exceed USD37 trillion by 2050.

We find that the direct mortality from COVID-19 will be significantly less than the indirect mortality driven by reduced economic output. While the direct mortality from the pandemic has not ended (and we lack sufficient testing and monitoring to understand key aspects of virulence), we estimate that, in a best-case scenario, an additional 250,000 people will die indirectly from the disease by 2030 compared with a world that did not have the economic disruption associated with COVID-19. In a worst-case scenario, the indirect mortality could grow to nearly 3.5 million people by 2030, more than 20 times the direct COVID mortality assumption used in this analysis.

This highlights the importance of continuing policies that both save lives and livelihoods by adding a new wrinkle: governments need to save lives in order to stimulate economic activity (and saving livelihoods). If we do not save lives by limiting spread and following epidemiological science, we will undercut livelihoods and see further increases in mortality due to reduced economic development. Saving lives and livelihoods are inextricably interrelated and the spread of the virus in Africa is not over.

We explored the effect of COVID-19 on development by comparing current projections with previous analysis published in *Africa's path to 2063: Choice in the face of Great Transformations:*

DEMOGRAPHIC TRANSFORMATION

- Prior to COVID-19, African population was set to grow from 1,343 million in 2020 to 2,507 million by 2050 and urban population was projected to grow from 584 million in 2020 to 1,383 million.
- The effect of COVID-19 on long-term demographic transitions is minimal. Over the short and long-run, COVID-19 is likely to have no significant effect on urbanization. Over the *COVID Base* is likely to show an increase in numbers of people living in urban centers driven by both larger populations (driven by higher fertility rates) and increased GDP per capita growth relative to 2020.

HUMAN DEVELOPMENT AND INEQUALITY

- The number of people living in extreme poverty is set to increase by 22 million people by 2021, 38 million people by 2030, 52 million people by 2040, and 39.5 million people by 2050. This represents a moderate percentage point increase in the number of people of 1.6 by 2021, 2.2 by 2030, 2.4 by 2040, and 1.5 by 2050 compared with a world without COVID-19.
- The economic toll will reduce government spending for key services. Overall, the cumulative reduction in government revenue comparing a world without COVID-19 to the current world is USD761 billion by 2030, USD2,270 billion by 2040, and USD5,145 billion by 2050.
- In the long term, changing patterns of government revenue are expected to significantly reduce spending on education, health, infrastructure, and the military. From 2020-2050, we estimate that the reduction in military spending could be close to USD400 billion, health spending reduced by more than USD550 billion, and education spending reduced by over USD1 trillion compared with a world without COVID-19.
- COVID-19 does little to change the transition between communicable and non-communicable disease deaths in Africa. Prior to COVID-19, 4.9 million Africans died of communicable disease in 2019 and 4 million died of non-communicable disease. In total, through 2030, the study projects an additional 1.9 million communicable disease deaths. However, the research also projects an increase of 102,000 non-communicable disease deaths, driven by less hospital access and fewer resources available to treat the sick.
- In 2019 we estimated that 53 million children in Africa that should be in primary school were not, and that number would reduce to 45.3 million by 2030, 34.6 million by 2040, and 19.7 million by 2050. However, the effect of COVID-19 on reduced economic activities will increase the number of children who are at risk of missing an education. The study estimates that, by 2030, an additional 1.7 million children will be out of primary school, with that number growing to 2.4 million by 2040 and 2.3 million by 2050.
- Nevertheless, broader stocks of knowledge developed in societies over generations take more than a global pandemic to fully erode. Measures of average years of education in a society change slowly, and prior to COVID we projected that the average years of education for someone 15 or older would grow from 6.2 years in 2019 to 6.9 years by 2030, 7.5 years by 2040, and 8.2 years by 2050. The effect of COVID is to reduce that by between 0.005 and 0.09 years relative to a *Pre-COVID Base* scenario. The overall reduction is greater further in the future.

TECHNOLOGY AND NATURAL SYSTEMS

- COVID-19 will have less overall effect on the diffusion of technology or ongoing transitions in natural systems. Information communication technology and renewable energy technology will continue to expand—though there will be short-term reductions in investment that are similar to the reductions we see in economic output. Climate change will continue grow as a threat, haunting the present and future, though carbon emissions will reduce in the short-term.

GOVERNANCE

- In previous work we highlighted the centrality of improving the quality of governance as a key leverage point that could greatly enhance Agenda 2063 ambitions. The COVID-19 pandemic reinforces this finding and highlights its centrality as governments move forward in responding to the interconnected policy framework: *saving lives, saving livelihoods.* While it appears that the direct mortality from COVID-19 is low, we must remember that we are likely still in the early stages of this unfolding pandemic and that mortality will grow where unchecked. If the pandemic grows people will respond by reducing economic activity, forcing governments to struggle with both stimulating the economy and not over-leveraging their future by amassing unsustainable levels of debt. These are not small challenges, and they require transparent and accountable leadership to properly address and avoid the growing threat of political instability.

The costs of this pandemic will be felt for decades and will drive much pain and suffering long after the virus has passed. But this is an opportunity for African leaders to re-imagine development from a continental perspective, reaffirm their commitments to regional and continental integration, and actively pursue the policies of Agenda 2063. A global pandemic highlights the undeniable interconnectivity of our world and should not cause countries to pull away and revert back into practices of isolationism and nativism. Instead, this challenge presents an opportunity to re-imagine development as a process characterized by pillars of *sustainability, inclusive policies,* and *economic development.*

INTRODUCTION

A global pandemic caused by the Severe Acute Respiratory Syndrome associated with Coronavirus (SARS-CoV-19 or COVID-19), spread across the world, including Africa. African governments responded to the pandemic by declaring states of emergency and lockdowns including closing international borders, implementing curfews and social distancing measures, and in many cases enforcing these restrictions through heavy policing. Projections by the Imperial College in the United Kingdom also published by the United Nations Economic Commission for Africa (UNECA) show about 300,000 to 3.3 million people could lose their lives from COVID-19 on the continent.[1] The International Monetary Fund (IMF) paints a bleak picture for sub-Saharan Africa's 2020 economic outlook with gross domestic product (GDP) shrinking to -1.6 per cent, a 5.1 per cent decline from Pre-COVID estimates.[2]

SPREAD, MORBIDITY AND MORTALITY IN AFRICA

Africa's initial COVID-19 cases were recorded in countries with the highest international exposure (Egypt, Morocco, Algeria, Nigeria and South Africa). Since Africa's first case, reported on 25th February 2020 in Algeria[3], the continent's infection rates have risen through March to June and continue to increase although remaining lower than the global average. However, the rate of infection may not be a reliable indicator of spread of the virus because of the continent's low testing capacity. According to data from WHO and the African Union, a total of 115,346 COVID-19 positive cases and 3,471 (CFR: 3 percent) deaths were reported in 54 African countries at the end of May, accounting for just about 2 percent of all cases reported globally. Health specialists and political analysts have raised questions over the seemingly low number of COVID-19 cases on the continent. They warn that this could be a ticking time bomb should there be a sudden sharp increase in the number of cases because African countries would be unable to cope due to weak public health infrastructure and the socio-economic context which will make it difficult to observe basic preventative measures like social distancing. Despite the steady increase in the number of COVID-19 cases, many countries in the region have eased lockdown restrictions in the hope of attenuating long-term economic impacts. The WHO has nonetheless urged caution in opening countries for business, and recommended governments implement rigorous public health measures at all levels of the national health systems, including community level.[4]

SOCIO-ECONOMIC IMPACT OF COVID-19

Following the WHO declaration of COVID-19 as a pandemic on 11th March 2020, governments across Africa responded quickly with public health measures to prevent the spread of the virus. While measures varied from country to country, they largely entailed restrictions on the movement of people and closing of business activities except what was listed as essential services, such as food supply. For example, South Africa declared a national state of disaster and implemented a nationwide lockdown in late March before reporting its first death from COVID-19. Uganda suspended public gatherings before the first documented case in the country. Nigeria began screening passengers at international airports nearly one month before the first case was detected.[5] It is not surprising, therefore, that Africa's swift actions to contain COVID-19 have been effective in suppressing transmission thus far.

However, the measures taken to slow down or hopeful halt the spread of COVID-19 have had significant and largely adverse impact on the socio-economic prospect of the continent. With IMF noting a largely COVID-19 induced 2020 GDP declining by about 5.1 per cent from Pre-COVID estimates (UNECA notes the same to decline from 3.2 percent to 1.8 percent in 2020). It is expected that consequences on the socio-economic front

[1] UN Economic Commission for Africa, "COVID-19 in Africa: Protecting Lives and Economies," COVID-19 Response, 2020, https://www.uneca.org/publications/covid-19-africa-protecting-lives-and-economies.

[2] IMF, "World Economic Outlook, April 2020: The Great Lockdown" (International Monetary Fund, April 2020), https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020.

[3] World Health Organization, "Coronavirus Disease 2019 (COVID-19)," Situation Report (WHO, March 6, 2020), https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200306-sitrep-46-covid-19.pdf?sfvrsn=96b04adf_2; SDG Center for Africa, "COVID-19: Unprecedented Risk to SDGs in Africa" (Sustainable Development Goals Center for Africa, May 2020), https://sdgcafrica.org/wp-content/uploads/2020/06/COVID-19-UNPRECEDENTED-RISK-TO-SDGs-IN-AFRICA_Web-Final.pdf.

[4] World Health Organization, "Coronavirus Disease 2019 (COVID-19)."

[5] Josephine Moulds, "How the Threat of COVID-19 Is Affecting People across Africa," World Economic Forum (blog), May 6, 2020, https://www.weforum.org/agenda/2020/05/africa-covid-19-coronavirus-pandemic-food-water-perc/.

will get worse if COVID-19 and the associated disruptions are not contained in the short-term.[6] Intra-African trade could be adversely impacted by exogenous supply chain disruptions as well as interruption in the global market links. Inter-African trade, particularly with some of the continent's more recent trading partners in Asia such as China, could also be severely impacted. This is already impacting on loss in income including at household levels – either by loss of employment or loss of business especially among the large informal economic actors.

At the national level, endogenous effects linked to disruption of economic activities due to lockdowns have affected aggregate demand causing a decrease in domestic tax revenue, further pressure on, what in many Governments, is already constrained Government fiscus. This is coming is the same stride with increased demand for public expenditure to safeguard human health and livelihood needs and support economic activities.[7] Other factors that will contribute to economic slowdown include reduction in production in several key industries including tourism and related services. Remittances from the African Diaspora is also expected to decline.

Socio-economic impacts of COVID-19 ensuing from lockdowns are also felt at the household level, especially in high-density urban areas. Significant portions of the urban population have lost and will continue to lose employment. 86 percent of the population in sub-Saharan Africa is in the informal sector[8]. Hence, large sections of the continent's populations are unable to engage in economic activities to sustain their livelihoods. While many African governments are slowly opening their countries for business, the prolonged economic shutdowns have brought adverse economic stress on poor households and communities already constrained in terms of access to basic livelihood needs including food, water, sanitation and health care. COVID-19 and related socio-economic consequences have exposed systemic structural weaknesses and fragilities which include the high levels of poverty and inequality.

African governments, together with the private sector and civil society, have responded with both "Saving Lives" and "Saving Livelihoods" measures. Additional supplies of medical products and services, this involves a diverse set of economic stimulus measures designed to mitigate the effects of the pandemic on the general population, especially the poor and disadvantaged. The measures vary from country to country, but they have mainly focused on distribution of food and personal protection equipment, particularly masks. Some countries, such as South Africa, have also disbursed significant fiscal support to mitigate wage losses and aid depressed business, especially in small and medium enterprises.

DEVELOPMENT POLICY IMPLICATIONS OF THE PANDEMIC

Within the context of Africa's development ambitions detailed in Agenda 2063, the pandemic has exposed two developmental policy challenges with significant implications for the future of the continent. First, COVID-19 has revealed a lack of strategic policies to foster sustained inclusive development. Critical developmental sectors which provide for basic human needs such as education, sanitation and health, energy, housing and social safety nets have largely been neglected, leaving populations particularly vulnerable to socio-economic shocks as has been triggered by the COVID-19 pandemic. It can be expected that even these immediate COVID-19 impacts on all levels of economic activities will certainly impact the continent's medium-long-term economic growth and development trajectories. Addressing COVID-19 is certainly more than just a health matter – it is even more so a development concern.

African governments must pursue an integrated response which simultaneously provides for immediate healthcare needs, embraces necessary economic stimulus measures and addresses underlying developmental issues - progressively contributing to structural change. This implies, as well deliberate efforts to address systemic fragilities and weakness in the economies and livelihoods exposed by COVID-19.

Second, the pandemic has highlighted and urgent and imperative need for Africa to begin to reimagine and adapt societies to changing realities. Remote working and learning and social distancing in all environments require new urban planning concepts. Significant disruption to the global supply chain primarily from an overreliance by African countries on sourcing from outside the continent (in recent years increasingly from China), should compel policy and investment interventions to radically expand and broaden local production capacity. Such strategic policy interventions would foster the aspirations of the African Continental Free Trade Area (AfCFTA), initially set to start in July 2020, now on hold due to myriad challenges resulting from COVID-19.

[6] UN Economic Commission for Africa, "COVID-19 in Africa: Protecting Lives and Economies."

[7] African Union, "Impact of the Coronavirus (COVID 19) on the African Economy" (African Union, 2020), https://www.tralac.org/documents/resources/covid-19/3218-impact-of-the-coronavirus-covid-19-on-the-african-economy-african-union-report-april-2020/file.html.african union

[8] ILO, "Women and Men in the Informal Economy: A Statistical Picture. Third Edition" (Geneva: International Labour Organization, April 30, 2018), http://www.ilo.org/global/publications/books/WCMS_626831/lang--en/index.htm.

PURPOSE AND SIGNIFICANCE OF THE STUDY

This report aims to support African policymakers and development specialists in their efforts to assess and understand impacts of COVID-19 and related socio-economic consequences on the continent's medium-long term development trajectories. This is to facilitate informed decisions, especially with regard to development policy choices. The study used a systems-thinking framework to identify the impact of the COVID-19 pandemic on Africa's economic growth and human development indicators in relation to ongoing developmental transformations. Using alternative scenarios, the study simulated possible development futures for the continent, reflecting the socio-economic effects of COVID-19 within Agenda 2063's time horizon. By providing timely analysis and information, the study outcomes will enable governments to:

a. identify and understand especially the COVID-19 related socio-economic impacts and consequences on Africa's economic growth and development trajectory, including impacts on disadvantaged and vulnerable sections of local populations

b. Identify evidence-based (locally appropriate, technically sound) policy options galvanise integrated economic recovery and growth, and

c. Stimulate broad-based and inclusive economies resilient in the event of future socio-economic shocks

Notwithstanding the significance of the epidemiological and healthcare concerns, this report does not delve into the technicalities of epidemiological interventions. Instead it focuses on socio-economic consequences of the pandemic, long-term trends in Africa's economic growth and development trajectories. The Study was designed to especially give a very African context to the pandemic and ensure and interpretation that is appropriate and relevant within an African narrative.

PLACING COVID-19 IN AFRICA'S SUSTAINABLE ECONOMIC GROWTH AND HUMAN DEVELOPMENT: SYSTEMS MAPPING

The COVID-19 pandemic is evolving with a large number of interacting variables across multiple systems. Many factors about the virus and its effects remains unknown or uncertain. This high level of uncertainties, including the numerous interpretations which are not necessarily similar, consistent and coherent has left policy makers with little evidence-based frameworks to evaluate and prioritize the competing policy choices. On the other hand, the pandemic has caused a socio-economic shock of global proportion – unprecedent in its every form and affecting even those countries and communities not yet directly impacted by the virus. Immediate action is required and countries (as well as individuals, business firms, governments, intergovernmental organizations and civil society) are already engaging in efforts to determine and implement interventions to mitigate, revive and catalyze increased economic growth and development (building back better).

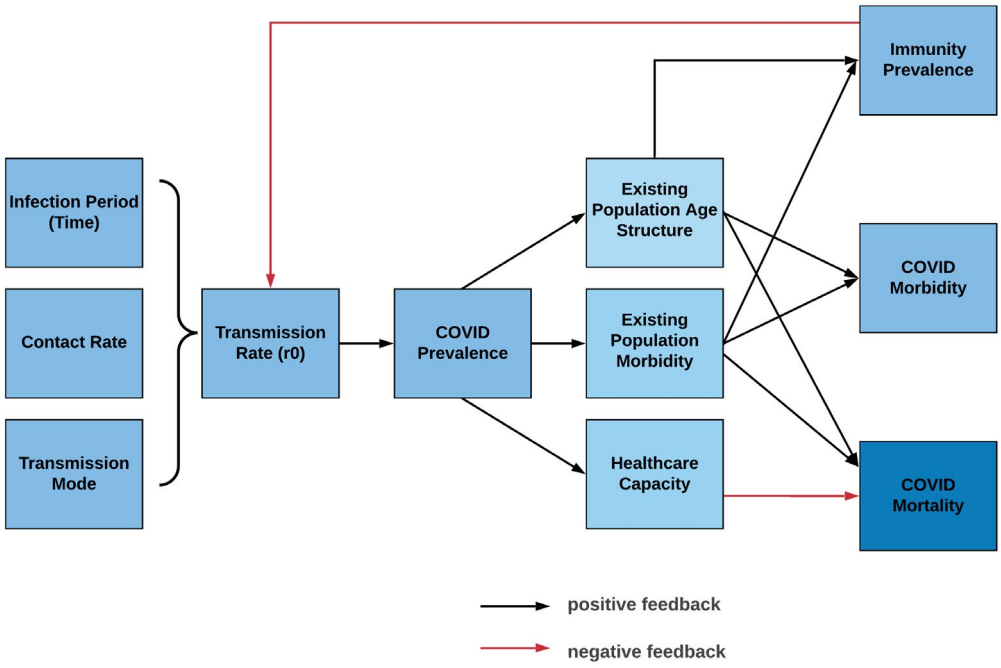
One characteristic of the pandemic related socio-economic shock is that the impacts are felt across all sectors, across multiples levels and systems – thematically and geographically. A 'systems mapping approach' - a framework identifying and connecting variables along with their positive or negative relationships and feedback loops - can be a useful tool to help policymakers develop a comprehensive and integrated understanding of how one set of variables dynamically interacts with others. The systems mapping developed in this study draws on ongoing studies focused on COVID-19. This is extended with an established and tested model of human, social, and biophysical systems (primarily focused on economics and demographics) called International Futures along with new information collected on governments and market responses to the current crisis. The analytic framework represents a conceptual model to guide an integrated and holistic thinking about the evolving situation and can assist African leaders in determining scientifically informed policies that could minimize the negative impacts of COVID-19 on the populations and the economy, particularly in a context of great uncertainty.

Figure 1: Macro systems map.

Three broad and interdependent sub-systems associated with COVID-19 are considered. These interrelated sub-systems *(Figure 1)* are:

- *Epidemiological sub-systems:* the ways through which the virus infects individuals and the conditions or behaviors that can influence the spread.
- *Economic - Demographic sub-systems:* socio-economic variables that the epidemiological systems directly impact and include mortality and changing patterns of economic activity.
- *Government-market sub-systems:* represent government and market responses to the effects of the virus. Responses include policies to control spread of the virus through to measures to sustain or stimulate economic activity.

Figure 2: Epidemiological systems map.



EPIDEMIOLOGICAL SYSTEMS

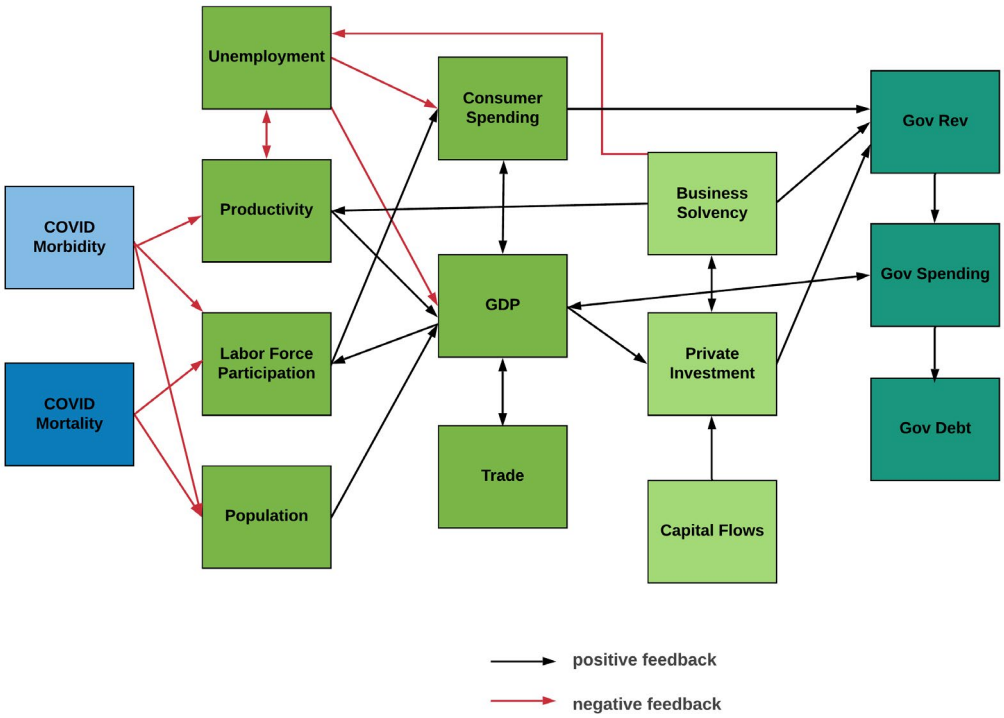
Epidemiologists use a number of techniques to model the spread of the disease, however, the most common method is classifying populations into groups of susceptible, infected, and removed. Susceptible populations are those who are at risk of infection, infected are populations that have and can potentially spread the virus, while removed are those that are either immune (because of vaccination or prior exposure) or have died. Contextualizing this perspective in broader environmental and social systems highlights some of the key drivers of spread and suggest possible pathways of control over the pandemic. For example, the rate of new infections can be attributed to several viral (such as the average period of infection and immunity), environmental (such as temperature or humidity), or behavioral characteristics (such as human interaction). Knowledge of this set of relationships provides us with a simple model that describes how the pandemic might unfold in different geographies and under different social or governmental responses. *Figure 2* shows an expanded epidemiological model.

The elderly suffers higher levels of mortality when infected,[9] helping shape country-level impact in terms of loss of life and policies that can protect particularly vulnerable groups of people. Existing population morbidity represents another key variable to understand when conceptualizing how different patterns of COVID-19 prevalence may lead to death - the research here suggests that some morbidities are significant drivers of mortality when infection sets in, such as heart disease, but much less research has been done in morbidities associated with some tropical communicable diseases, such as malaria This is particularly an important dimension in countries that struggle with large health burdens from factors such as HIV/AIDS, smoking-related conditions and malnutrition.[10] *Figure 2* illustrates how the epidemiological characteristics of the virus interact with population characteristics and existing healthcare capacity to influence overall COVID-19 morbidity and mortality.

[9] Francisco Caramelo, Nuno Ferreira, and Barbara Oliveiros, "Estimation of Risk Factors for COVID-19 Mortality - Preliminary Results," MedRxiv, February 25, 2020, 2020.02.24.20027268, https://doi.org/10.1101/2020.02.24.20027268.

[10] Caramelo, Ferreira, and Oliveiros.

Figure 3: Economic-demographic systems map.

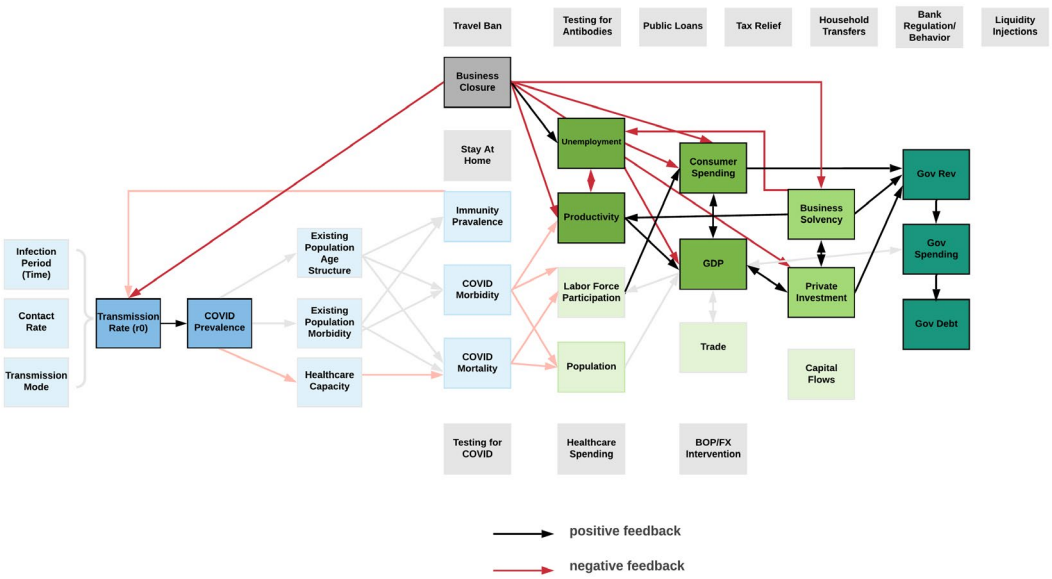


ECONOMIC-DEMOGRAPHIC SYSTEMS

While many epidemiological system dynamics remain uncertain because of the character of the unfolding pandemic, dynamics associated with demographic and economic systems are more straightforward. Even without considering official stay-at-home policies, the pandemic reduces labor participation through the self-isolation of the infected and symptomatic, due to those who stop participating in economic activities to care for those who are ill. As the disease spreads, these shocks to labor participation can have negative effects on overall levels of GDP through reduced consumer spending, productivity, and ultimately business solvency. Responses to the virus require funding to save lives directly at risk from COVID-19 via healthcare needs and economic stimulus programs. With little or no reserves, the associated increase in government spending will need to be supported through borrowing, increasing the sovereign debt burden. On the other hand, the economic damage is driven not only by domestic policies, but also by dynamics in the global economic movements. This makes countries heavily dependent on external trade more vulnerable in suffering the effects of the disruptions in import and export supply chains.

This requires a multi-dimensional policy response that considers and intervenes across multiple issues and sectors simultaneously. The map below illustrates the relationship between COVID-19 morbidity and mortality and economic, demographic and governmental variables.

Figure 4: Effect of business closure on system dynamics.



GOVERNMENT AND MARKET RESPONSE

When COVID-19 arrived in Africa, governments responded to protect the lives of the citizens by implementing policies to control spread of the virus. And the efficacy of these policies led to additional issues and challenges stemming from reduced economic activity and strain on health systems.

To varying degrees, governments also moved rapidly to intervene to influence the changing supply and demand of goods and services. Efforts included supporting those negatively affected by the virus and associated shutdowns as well as stimulating critical aspects of the economy. The IMF tracks the types of government response mechanisms in two broad categories, namely, those designed to slow down the spread of the virus and the fiscal and monetary measures designed to sustain or stimulate economic activities[11].

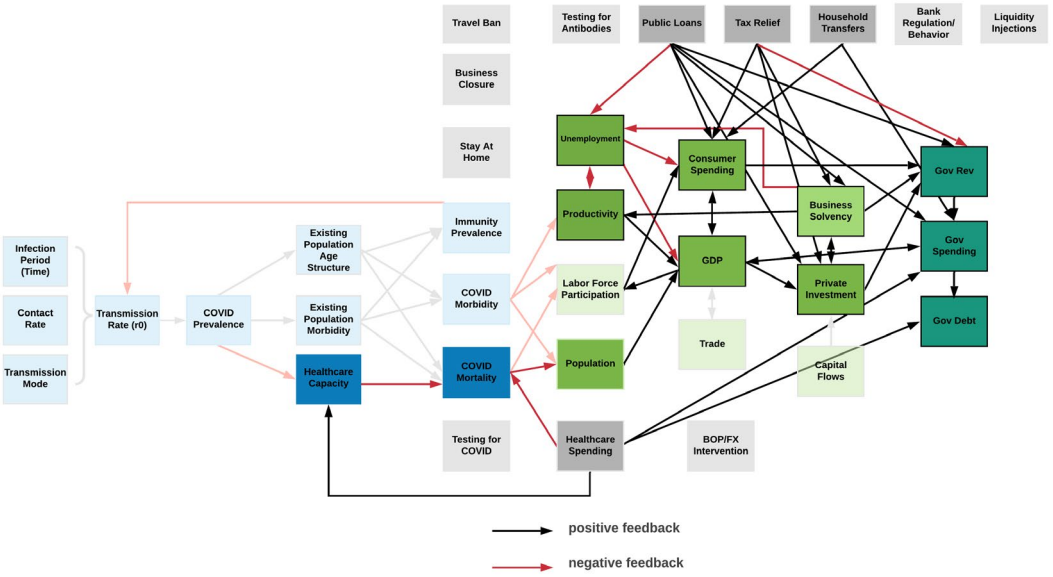
Some of the effects of these policies can be understood by exploring the interactions of the systems mapping to identify trade-offs and better understand system dynamics. For example, a policy that closes businesses to control the spread of the virus *(see Figure 4)*, has the effect of reducing the transmission rate of the virus while also negatively impacting productivity, employment, and consumer spending. These dynamics can have long-term negative impacts on government revenues, social program expenditures, household income and thereby human well-being.

Other policies may be introduced to mitigate some of the negative effects of COVID-19 including those that increase government spending to stimulate development and improve human well-being. *Figure 5* illustrates the impact of certain fiscal policies including increasing the availability of loans to businesses, providing tax relief, increasing healthcare spending, and directly transferring cash to households on consumer spending, unemployment and business solvency.

[11] IMF, "Policy Responses to COVID-19," International Monetary Fund, 2020, https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19.

Government interventions - to mitigate the spread of the virus and reduce the socio-economic impacts - is necessary to avoid potentially worse outcomes as a result of the pandemic. Balancing the tradeoffs between mitigating the virus and supporting the economy to minimize negative impacts requires a systems-level understanding. Through a systems-mapping framework, policymakers can compare and contrast policy strategies by considering a range of possible outcomes as well as synergies and tradeoffs associated with interacting policy packages.

Figure 5: Effect of fiscal policy on system dynamics.



IDENTIFYING VULNERABLE POPULATIONS TO ENVISION SYSTEMS OF RESILIENCE

The systems framework introduced above can be used for a variety of purposes. It is essentially a model that can help policy-makers think about the broad and dynamic effects of policy-choices on other systems of development. For example, even though the virus spread to Africa relatively "late" compare to other regions, it remains important to focus on the epidemiological systems highlighted above. While most African states have been focused on both slowing the spread of the virus and stimulating economic activity, the systems framework above reminds us to stay vigilant to the broad development context in which this virus is changing pattens of development.

The systems framework also provides for a framework for thinking about how this virus is likely to impact development systems in unique ways and can be useful for identifying particularly vulnerable populations or development conditions that should be the focus of ongoing policy-making. Many factors make populations vulnerable to COVID-19, including age structures, level of economic informality, dependence on food imports, dependence on foreign debt and government capacity/ stability. Analyzing each of these dimensions in a country-specific context can help policy-makers plan for further disruptive events associated with the spread of COVID-19. Furthermore, countries can assess where to focus intervention policies to mitigate the most severe socio-economic effects and build more resilient systems.

Several studies in epidemiology identify older populations as the most vulnerable to the spread of COVID-19.[12] Age alone is not sufficient to understand vulnerability associated with COVID-19. Other factors such as the quality and degree of

[12] CDCMMWR, "Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19) - United States," MMWR. Morbidity and Mortality Weekly Report 69 (March 18, 2020), https://doi.org/10.15585/mmwr.mm6912e2; Robert Verity et al., "Estimates of the Severity of COVID-19 Disease," MedRxiv, March 13, 2020, 2020.03.09.20033357, https://doi.org/10.1101/2020.03.09.20033357.

preparation of the national health system,[13] disease mutation,[14] hospital capacity,[15] population co-morbidities,[16] and accurate accounting of cases,[17] influence mortality rates across countries.

Africa has a young age structure compared with other regions. As a share of the total population, the age distribution alone means that a smaller proportion of people with COVID-19 will likely die assuming a similar level of disease prevalence. Only eight countries in Africa (Mauritius, Seychelles, Tunisia, Morocco, Algeria, South Africa, Egypt, and Cape Verde), have a 65+ population share above 5 percent. Only 7 countries (Nigeria, Egypt, Ethiopia, South Africa, Morocco, and Democratic Republic of Congo), have an absolute 65+ population above 2 million people. Nevertheless, the continent is home to nearly 50 million people older than 65 years with the majority located in the East and West. This is slightly lower than the total number of over 65 living in the United States (55 million), and significantly lower than the number of people over 65 living in India (91 million), the European Union (93 million), and China (178 million). These 50 million people will be particularly vulnerable to the spread of COVID-19 and will require governmental policies to encourage their social distancing as the virus spreads.

Another vulnerable population are those who are heavily reliant on the informal economy for survival. Formal economic activity is easier to track than informal economic activity, and governments can more effectively stimulate a slow-down in the former compared with the latter. The International Labor Organization (ILO) estimates that globally informal workers will see a 60 percent decline in income in the first month of the crisis and that Africa is expected to see the largest decline.[18]

In Africa, approximately 58 percent of total labor and 26 percent of total GDP is informal, by far the highest of any region in the world. Countries with larger shares of informal economic activity will experience a different set of policy trade-offs in responding effectively to COVID-19 spread. Considering the large participation of youths and women in the informal sector, there is likely to be social tension, which could manifest in political struggle leading to political instability as people search for ways to make a living.

The economic effects of the spread of COVID-19 has also highlighted challenges associated with global economic interdependence. Countries with higher levels of dependence on trade with the rest of the world across sectors may be more vulnerable to disruptive shocks and may need to pursue strategies to manage interdependence now and in the future. Pursuing policies associated with increased export diversification for intra-African trade is one step in the right direction.

While countries heavily embedded in global economic systems may experience disruptions associated with changing economic outlooks in import and export partners, other countries may be more vulnerable to disruptions associated with food production systems. Africa's rapid population growth has outweighed gains in food production and the region has compensated through food imports. Currently, Africa's agricultural imports are 20 percent of its production by volume, growing from 11 percent in 2000. The disruption of COVID-19 to global supply chains risks precipitating food security crises. Seven countries (Djibouti, Seychelles, Lesotho, Mauritania, Cape Verde, Botswana, and Gambia) have higher agricultural imports than agricultural production.

Countries with large debt burdens will find it increasingly difficult to combat the deteriorating socio-economic conditions and stimulate economic recovery. This is expected to additionally affect the ability of governments to implement longer-term strategies for development and social welfare. As of 24 May 2020, the IMF approved 24 emergency financing packages for sub-Saharan Africa with a combined value of 7,8 million SDR. Nigeria accounts for almost 35 percent of the region's financial assistance, followed by Ghana with approximately 10 percent, Cote d'Ivoire with 9 percent, Kenya just below 8 percent, and Uganda with 5 percent. Although the region is receiving most assistance packages, existing debt burdens and limited financial resources suggest African countries will have significant challenges related to economic consequences of COVID-19.

[13] Wai-Kit Ming, Jian Huang, and Casper J. P. Zhang, "Breaking down of Healthcare System: Mathematical Modelling for Controlling the Novel Coronavirus (2019-NCoV) Outbreak in Wuhan, China," BioRxiv, January 30, 2020, 2020.01.27.922443, https://doi.org/10.1101/2020.01.27.922443.i

[14] Nathan D. Grubaugh, Mary E. Petrone, and Edward C. Holmes, "We Shouldn't Worry When a Virus Mutates during Disease Outbreaks," Nature Microbiology 5, no. 4 (March 2020): 529–30, https://doi.org/10.1038/s41564-020-0690-4; Jiao-Mei Huang et al., "Evidence of the Recombinant Origin and Ongoing Mutations in Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)," preprint (Microbiology, March 17, 2020), https://doi.org/10.1101/2020.03.16.993816.h

[15] Ezekiel J. Emanuel et al., "Fair Allocation of Scarce Medical Resources in the Time of Covid-19," New England Journal of Medicine 0, no. 0 (March 23, 2020): null, https://doi.org/10.1056/NEJMsb2005114; Thomas C. Tsai, Benjamin H. Jacobson, and Ashish K. Jha, "American Hospital Capacity And Projected Need for COVID-19 Patient Care | Health Affairs," Health Affairs (blog), March 17, 2020, https://www.healthaffairs.org/do/10.1377/hblog20200317.457910/full/.

[16] Amitava Banerjee et al., "Estimating Excess 1- Year Mortality from COVID-19 According to Underlying Conditions and Age in England: A Rapid Analysis Using NHS Health Records in 3.8 Million Adults," March 24, 2020, 23; Jing Yang et al., "Prevalence of Comorbidities in the Novel Wuhan Coronavirus (COVID-19) Infection: A Systematic Review and Meta-Analysis," International Journal of Infectious Diseases: IJID: Official Publication of the International Society for Infectious Diseases, March 12, 2020, https://doi.org/10.1016/j.ijid.2020.03.017.

[17] David Adam, "Modelers Struggle to Predict the Future of the COVID-19 Pandemic," The Scientist Magazine, March 12, 2020, https://www.the-scientist.com/news-opinion/modelers-struggle-to-predict-the-future-of-the-covid-19-pandemic-67261; David Baud et al., "Real Estimates of Mortality Following COVID-19 Infection," The Lancet Infectious Diseases 0, no. 0 (March 12, 2020), https://doi.org/10.1016/S1473-3099(20)30195-X.

[18] ILO, "COVID-19 and the World of Work. Third Edition: Updated Estimates and Analysis," ILO Monitor (International Labour Organization, April 29, 2020), https://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/documents/briefingnote/wcms_743146.pdf.

MODELING THE EFFECT OF COVID-19 ON DEVELOPMENT

This study modeled the effect of COVID-19 on development in Africa across six scenarios, outlined in *Table 1*. To create these scenarios, a number of assumptions on the economic and mortality effects of COVID-19 in Africa were defined. Changing those variables (see *Table 1* for a description of the assumptions used) then propagate throughout the IFs modeling system, impacting issues related to income distribution, education, governance, and other development indicators.

Table 1: COVID-19 scenarios.

CORE SCENARIOS	
Pre-COVID Base Case	IMF WEO 2019 update for 2020, 2021, IFs endogenous growth for 2022-2050. IFs Base Case mortality assumptions, nothing COVID related.
COVID Base Case	IMF WEO 2020 update for 2020, 2021, IFs endogenous growth for 2022-2050. Extrapolation of measured cases as % population through 2020. Mortality table high values.
ALTERNATIVE VERSIONS OF THE COVID BASE CASE	
High Mortality, High Growth	Productivity increased 1.5% GDP above IMF WEO 2020 update for 2020, 2021, IFs endogenous growth for 2022-2050. Productivity increased 1.5% GDP through 2025, endogenous growth after. Extrapolation of measured cases as % population through 2020, doubled. Mortality table high values.
Low Mortality, Low Growth	Productivity decreased 1.5% GDP above IMF WEO 2020 update for 2020, 2021, IFs endogenous growth for 2022-2050. Productivity decreased 1.5% GDP through 2025, endogenous growth after. Extrapolation of measured cases as % population through 2020, cut in half. Mortality table low values.
Low Mortality, High Growth	Productivity increased 1.5% GDP above IMF WEO 2020 update for 2020, 2021, IFs endogenous growth for 2022-2050. Productivity increased 1.5% GDP through 2025, endogenous growth after. Extrapolation of measured cases as % population through 2020, cut in half. Mortality table low values.
High Mortality, Low Growth	Productivity decreased 1.5% GDP above IMF WEO 2020 update for 2020, 2021, IFs endogenous growth for 2022-2050. Productivity decreased 1.5% GDP through 2025, endogenous growth after. Extrapolation of measured cases as % population through 2020, doubled. Mortality table high values.

MORTALITY ASSUMPTIONS EFFECT ON DEMOGRAPHIC SYSTEMS: SPREAD AND SEVERITY OF DISEASE

Measuring the prevalence, incidence, or mortality associated with COVID-19 is a challenge for many reasons. Testing is not widely available on a per-capita basis across most of the continent. Of data available from 1 June 2020 on per capita testing, 68 countries are reported with African states ranking 39th (South Africa), 46th (Rwanda), 47th (Tunisia), 56th (Senegal), 60th (Uganda), 63rd (Kenya), 64th (Zimbabwe), 65th (Ethiopia), and 68th (Nigeria). The level of testing matters because asymptomatic carriers represent a large share of COVID-19 cases and go unnoticed without widely available tests.[19] As such, it is assumed that the "measured case count" or the number of people who have been tested as a share of the population is broadly misleading. Hence, the focus is on measured COVID-19 deaths as a more reliable indicator. While measured COVID-19 mortality data is more reliable than the measured case count, mortality data also significantly underestimate deaths from COVID-19 for at least two reasons. First, testing is required to identify a COVID-19 death, and testing is not widely available in most African countries. Second, COVID-19 affects many of people who already have comorbidities, so a COVID-19 death can look like a death from another disease category and go unchecked.

Considering the challenges in measuring prevalence and mortality rates, the report makes very general assumptions about COVID-19 mortality in Africa. The model used for this analysis is not an epidemiological tool that is meant to predict the specific burden of mortality. Instead, the study makes general assumptions about the share of the population that is likely to be infected with COVID-19 and adds them in the IFs tool. See *Table 2* for the mortality assumptions for the continent used in this analysis.

Table 2: Direct mortality assumption driven by COVID-19, millions of people.

COVID-19 Base	*Low Mortality, High Growth*	*High Mortality, Low Growth*	*High Mortality, Low Growth*	*Low Mortality, Low Growth*
0.158	0.033	0.318	0.318	0.033

A low-end mortality of just over 33,000 for the continent and a high-end mortality of 318,000 is assumed. The *COVID-19 Base* mortality is 158,000 for the continent, a figure that will be higher than analysts focusing on the current mortality trends in Africa suggest, but much lower than some epidemiological models predict.[20]

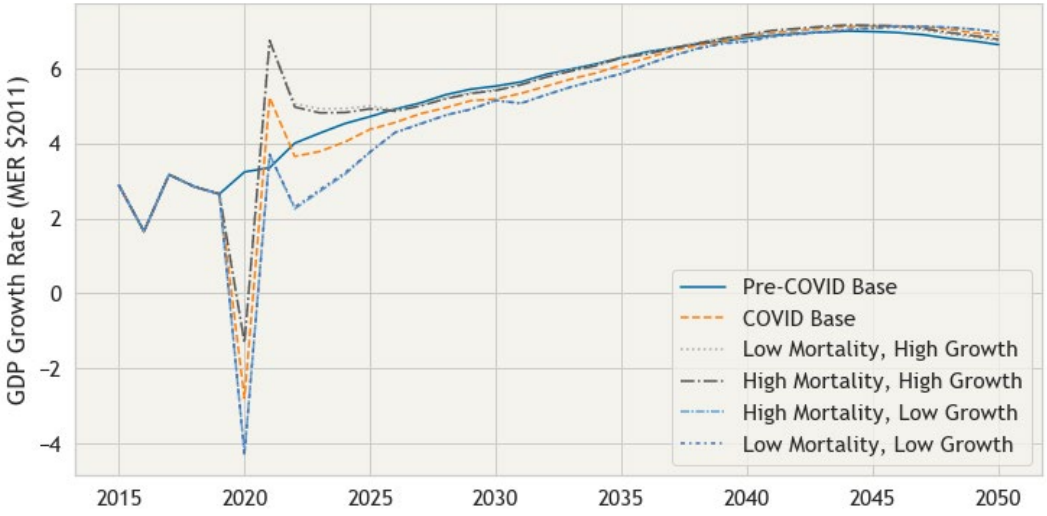
ECONOMIC ASSUMPTIONS

For economic assumptions, the study draws upon a comparison of GDP growth rates produced by the IMF World Economic Outlook estimates for 2019 and 2020. The GDP growth rates for 2019 are used in the *Pre-COVID-19 Base*, while those in 2020 represent the *COVID-19 Base*. For alternative scenarios illustrated in *Figure 6*, GDP growth rates around the *COVID-19 Base* vary by 1.5 percentage points of GDP growth in 2020 and 2021, then taper the effects to 2025. By varying GDP growth around the IMF projections, we assume that the IMF is neither optimistic nor pessimistic, an assumption that may be questionable. The more optimistic GDP growth assumption is the least likely outcome of the GDP growth scenarios. The approach used here does not create alternative recovery trajectories that reflect different assumptions about a "v-shaped", "u-shaped" or "l-shaped" trajectory.

[19] Cate Cadell and Roxanne Liu, "Explainer: Are Asymptomatic COVID-19 Patients Safe or Silent Carriers?," Reuters, June 3, 2020, https://www.reuters.com/article/us-health-coronavirus-asymptomatic-expla-idUSKBN23A21S.

[20] Cara Anna, "Africa Could See 300,000 Coronavirus Deaths This Year, Report Says," The Philadelphia Inquirer, April 17, 2020, sec. Coronavirus, Health, Nation & World, News, https://www.inquirer.com/health/coronavirus/africa-coronavirus-deaths-projected-imperial-college-london-report-20200417.html.

Figure 6: GDP growth rate assumptions across alternative scenarios.



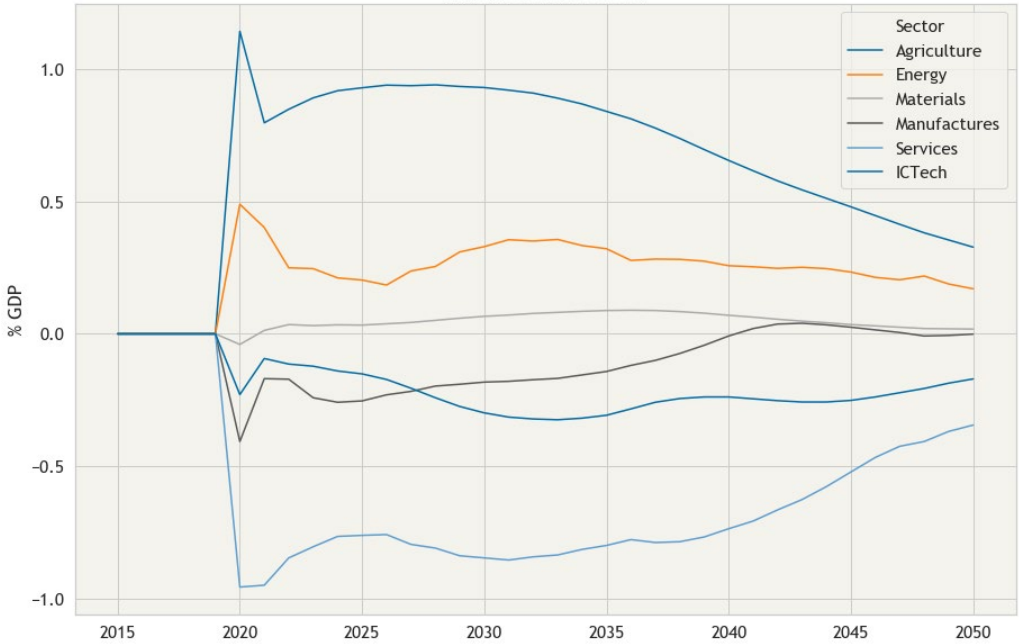
The *COVID-19 Base* reduces economic output in 2020 by USD192 billion *(Table 3)*. Scenarios with greater or lesser economic effects range from -USD150 to -USD234 billion in 2020. Moving forward, the economic costs grow significantly in a *COVID Base* world, with the cumulative economic cost growing to USD2.8 trillion by 2030, USD8.9 trillion by 2040 and USD19.9 trillion by 2050. In more pessimistic scenarios the cumulative costs exceed USD37 trillion by 2050.

Table 3: Cumulative economic effect of COVID-19 in Africa across alternative scenarios.

	COVID Base	*Low Mortality, High Growth*	*High Mortality, High Growth*	*High Mortality, Low Growth*	*Low Mortality, Low Growth*
2020	-USD192	-USD150	-USD150	-USD234	-USD234
2025	-USD1,210	-USD349	-USD381	-USD2,029	-USD2,017
2030	-USD2,829	-USD463	-USD585	-USD5,015	-USD4,982
2040	-USD8,873	-USD952	-USD1,468	-USD15,944	-USD15,877
2050	-USD19,920	-USD1,000	-USD2,052	-USD37,127	-USD37,078

These changes to economic growth re-structure the future sectoral distribution of African economies. *Figure 7* shows these changes by comparing the *Pre-COVID Base* with the *COVID Base* for value-add as a share of African GDP. The results suggest that the COVID-19 crisis will reduce the future share of economic activity associated with services by about one percentage point while increasing the role of agriculture and energy within the African economic mix.

Figure 7: Effect of COVID-19 on African sectoral production as a share of GDP.



COVID-19 control measures will significantly impact trade at nearly all levels, including Africa's CFTA intra-Africa trade ambitions. As alluded to earlier in the report, countries will heavy import-export dependence are likely to be impacted more in terms of the socio-economic consequences. In the immediate term, the disruptions in the local and global supply chain systems depressing both economic supply and demand levels. *Figure 8* indicates a 15.6 percent drop in Africa's export earnings – from about USD688 down to USD581. This loss remains so, even widening through to 2050 (pre-COVID-19 at USD1,428 billion as compared to the COVID-19 USD1,256 billion). *Figure 9* presents the same information as a percentage of the GDP. Implications and impacts on key aspects of economic growth and development will be far and wide from depressed industrial growth, reduced Government revenues through to job losses and contracted entrepreneurship opportunities.

Figure 8: Exports Africa in Billion USD

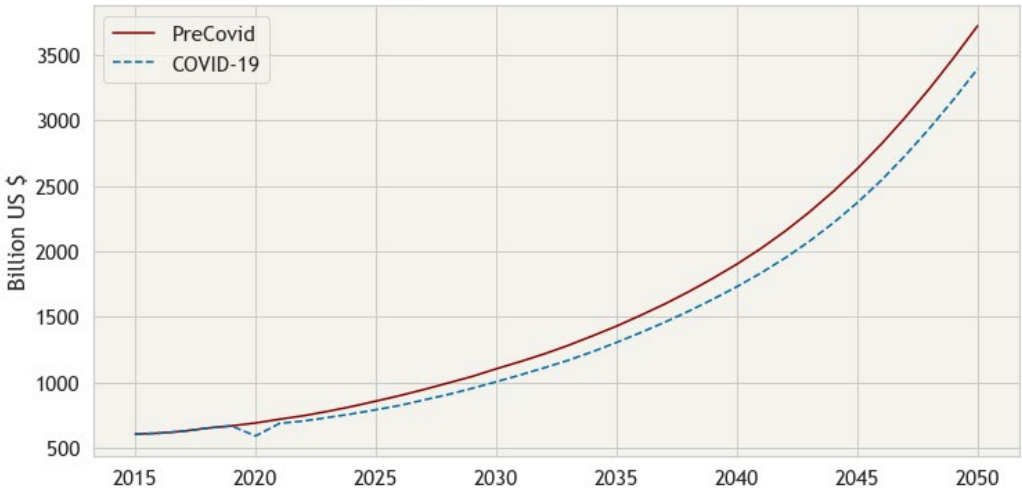
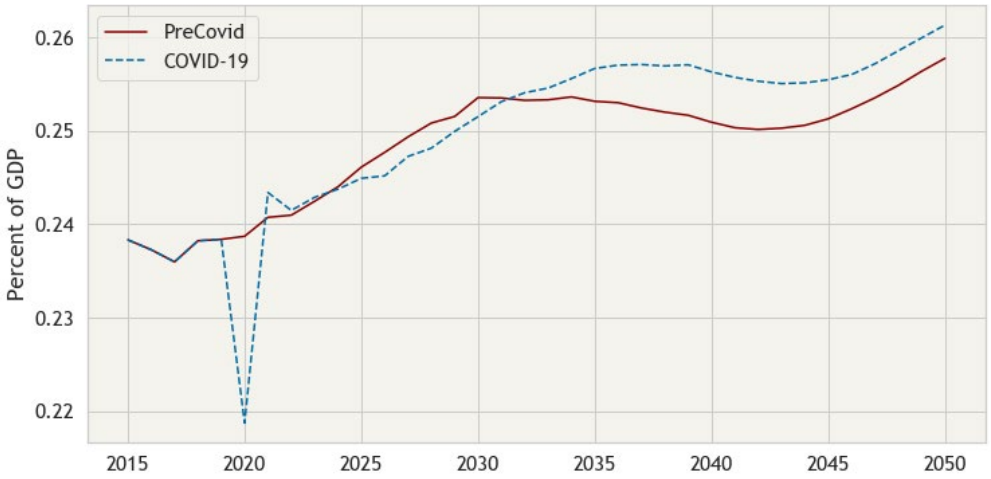


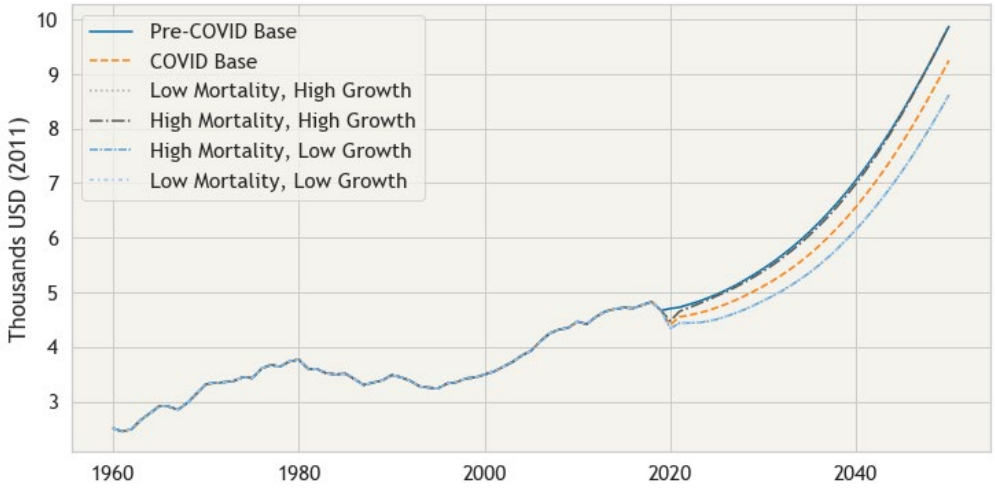
Figure 9: Exports Africa as percentage of GDP



INTERACTION OF ECONOMIC AND MORTALITY ASSUMPTIONS

Both the mortality and economic assumptions have a direct effect on GDP per capita (at purchasing power parity), though the magnitude of the economic effects is much larger. Both indicators reduce GDP in a *COVID Base* world to USD4.4 thousand per person from a *Pre-COVID Base* value of USD4.7 thousand in 2020 *(Figure 8)*. It is only in 2024 that *COVID Base* GDP per capita value reaches the *Pre-COVID Base* value in 2019, a five-year "setback" in development. A more pessimistic scenario suggests that this setback in development could last until 2028. However, more optimistic scenarios suggest that the return to GDP per capita levels seen in 2019 could happen as soon as 2022.

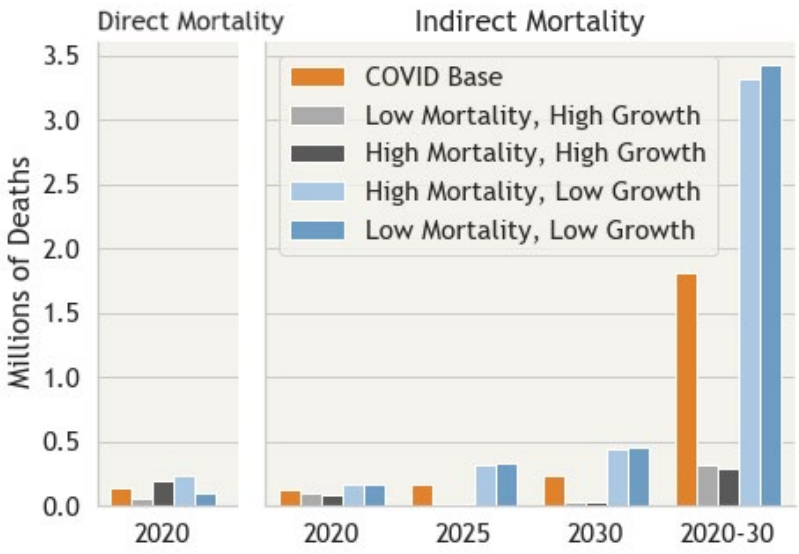
Figure 10: Alternative scenarios and GDP per capita (at PPP).



Nevertheless, it is important to note that scenarios with similar economic assumptions follow a similar trajectory, but the demographic results do not, and distinct scenario trajectories presented in *Figure 11* suggest that future development trajectory will be most impacted by the economic effects of COVID-19 than the direct mortality effects. The direct COVID-19 mortality assumptions *(Table 1)* across each scenario are shown on the left, and indirect mortality (those who die not as a direct result of COVID-19, but driven by reduced economic activities) are shown in 2020, 2025, 2030, and then cumulatively from 2020-2030.

In the *COVID Base* scenario the study assumed that 158,000 people die from COVID-19 in Africa in 2020. In addition to that, the long-term reduction in development caused by COVID-19 could drive an increase in mortality in 2025 of 170,000 and in 2030 of 240,000. Cumulatively, the indirect mortality (those deaths attributable to COVID-19 via economic shocks rather than directly due to the disease) exceeds 1.8 million through 2030.

Figure 11: Direct and indirect mortality effects from COVID-19 across time and scenario.



These dynamics in trajectories are more evident when comparing the *High Mortality, Low Growth* scenario (assuming the worst economic growth and highest mortality) with the *Low Mortality, Low Growth* scenario (with the worst economic growth and the best mortality). The initial mortality assumption is much higher in the *High Mortality, Low Growth* scenario compared with the *Low Mortality, Low Growth* scenario (318,000 deaths compared with 33,000 deaths). However, the long-term indirect mortality is higher in the *Low Mortality, Low Growth* scenario. This indicates the way in which direct COVID-19 mortality and indirect mortality stemming from reduced economic output change development dynamics. While the *Low Mortality, Low Growth* scenario keeps more people alive in the immediate aftermath of COVID-19, many of these are elderly and vulnerable to other forms of mortality associated with lack of access to food, water and sanitation, and healthcare. Overall, more people die in the *High Mortality, Low Growth* scenario through 2030 than in the *Low Mortality, Low Growth* scenario, but not by the magnitude that would be assumed based on the initial assumption of direct COVID-19 mortality.

This finding does not suggest that governments should forgo actions to reduce the spread of COVID-19 in an effort to mitigate economic consequences, and therefore reduce future indirect mortality at the expense of current COVID-19 mortality. People must believe that they will not die or jeopardize the lives of their loved ones by engaging in economic activity, so government action to mitigate the spread of the disease is crucial to create the economic activity that is needed to sustain life of vulnerable populations. For example, self-imposed social distancing due to fear of mortality from the virus creates citizen-driven reduction in economic activity. This ultimately increases long-term indirect mortality associated with reductions in economic output. These model results are also informed from the systems framework presented earlier.

These findings further illustrate how COVID-19 can disproportionately affects vulnerable populations. The level of poverty, the size of informal economies and the high presence of co-morbidities make African populations particularly susceptible to increased mortality as a result of economic disruptions. In this context, policymakers should pursue policies which create long-term resilience and simultaneously balance multiple priorities including stopping the spread of COVID-19 and also promoting economic growth.

AFRICA'S HUMAN DEVELOPMENT TRANSFORMATIONS AND COVID-19

Choices in the face of great transformations is a report that analyzed four developmental transformations taking place in Africa and one final transition in governance that could catalyze significant future development if it were pursued.[21] The four transitions were in demographics, human development and inequality, technology, and natural systems. These transitions were noted as persistent and characterize development over the next 40-plus years. Here we evaluate these transformations in light of COVID-19.

DEMOGRAPHIC TRANSITIONS

The total population is poised to grow dramatically, increasing overall size and urban populations by millions from 2020-2050. Total population in a *Pre-COVID Base* world was set to grow from 1,343 million in 2020 to 2,507 million by 2050.

The effect of COVID-19 on long-term demographic transitions is minimal. In IFs, the total population growth in the *COVID Base* through 2050 is greater than in the *Pre-COVID Base* (in spite of the greater levels of mortality in the COVID Base). The increase in population size is driven by increases in total fertility relative to a *Pre-COVID Base* scenario. In both scenarios the fertility rate across Africa drops from 4.47 in 2019 to 2.64 in 2050 in a *Pre-COVID Base* and 2.69 in a *COVID Base* scenario. This small increase in fertility rates translates into millions of additional births. In 2019 IFs estimates that 43.8 million births took place in Africa. By 2050, IFs estimates that 51.9 million new births would occur in the *Pre-COVID Base* and 53.1 million births in a *COVID Base* world. The cumulative additional births driven by the *COVID Base* scenario relative to the *Pre-COVID Base* world by 2050 is 22.6 million, or just over half of the births that took place in 2019.

In that previous report we projected that urban population would grow from 584 million in 2020 to 1,383 million. Over the short and long-run COVID-19 is likely to have no significant effect on urbanization. Over the long-term, the *COVID Base* is likely to show an increase in numbers of people living in urban centers driven by both larger populations (driven by higher fertility rates) and increased GDP per capita growth relative to 2020 (GDP per capita in 2050 in a *COVID Base* is projected to be twice as high as it was in 2019). In the *COVID Base* growth in the share of Africa's population living in urban centers is lower than in the *Pre-COVID Base*, but only notionally.

HUMAN DEVELOPMENT AND INEQUALITY

In 2019, Africa's total government revenue was estimated at USD691 billion. In 2020, Government revenue is expected to decline in a *COVID Base* scenario to USD653 billion. Overall, the cumulative reduction in government revenue comparing the *Pre-COVID Base* with the *COVID Base* is USD761 billion by 2030, USD2,270 billion by 2040, and USD5,145 billion by 2050.

The effect of reduction in revenue could drive increases in government debt as well as reductions in government spending programs. In the long term, changing patterns of government revenue are expected to significantly reduce resources for agriculture, cash transfers, education, health, infrastructure, and the military. From 2020-2050, we estimate that the reduction in military spending could be close to USD400 billion, health spending reduced by more than USD550 billion, and education spending reduced by over USD1 trillion compared with a *Pre-COVID Base* scenario, with additional reductions in other spending areas.

Comparing a *COVID Base* with a *Pre-COVID Base*, the study show that the number of communicable disease deaths do increase across time, driven both by immediate COVID-19 deaths as well as long-term deaths of the most vulnerable populations with reduced economic production and consumption. In total, through 2030, the study projects an additional 1.9 million communicable disease deaths. However, the research also projects an increase of 102,000 non-communicable disease deaths, driven by less hospital access and fewer resources available to treat the sick. Over the long-term, the transition between non-communicable disease death and communicable disease deaths remains a persistent trend. Across the scenarios the impact on life expectancy is moderate, with the best-to-worst case scenario showing a shift in 0.5 years across the time horizon.

[21] Jonathan D. Moyer et al., Africa's Path to 2063: Choice in the Face of Great Transformation (Denver, CO and Midrand, Johannesburg: Frederick S. Pardee Center for International Futures and NEPAD Planning and Coordinating Agency, 2018).

Education systems will also be hit by the COVID-19 pandemic, with millions of children experiencing reduced schooling in the short term. While many of the short-term effects will be important, the long-term effects of reduced resources for education, coupled with larger overall populations, would drive lower future human capital development. It is estimated that in 2019, 53 million children in Africa that should be in primary school were not, and that number would reduce to 45.3 million by 2030, 34.6 million by 2040, and 19.7 million by 2050. However, the effect of COVID-19 on reduced economic activities will increase the number of children who are at risk of missing an education. The study estimates that, by 2030, an additional 1.7 million children will be out of primary school, with that number growing to 2.4 million by 2040 and 2.3 million by 2050.

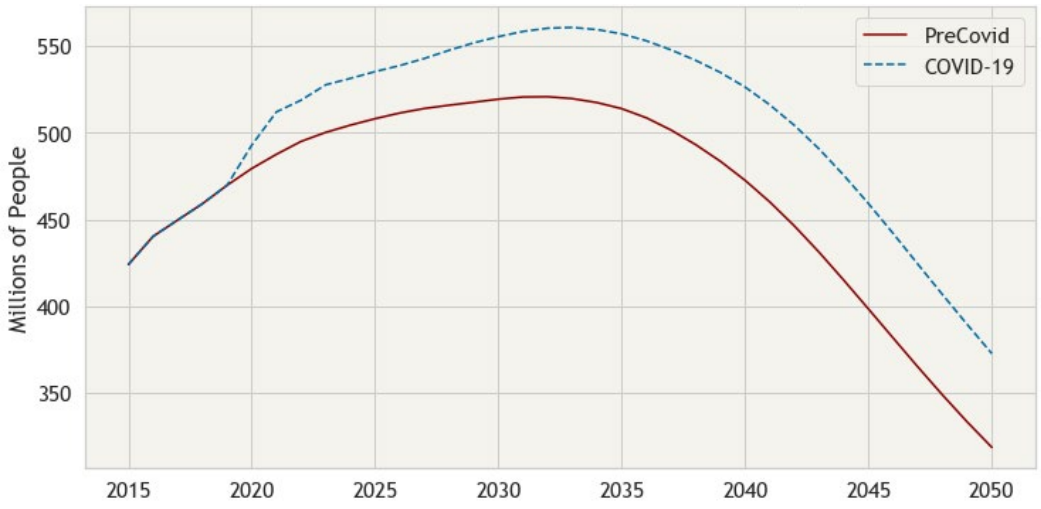
The story is similar for students in secondary, though there are many more that are missing from education systems in Africa today. We estimated that, in 2019, 119.8 million students who should have been in secondary school were not, with that number growing to a peak of 122 million in 2027 and then declining across time, eventually falling below 105 million by 2050. Yet, the effect of COVID-19 is to increase the number of children out of school by 2.3 million by 2030, by 3.2 million by 2040, and by 4.2 million by 2050. In addition, the study expects budget constraints to lead to a reduction in education quality in both math and sciences.

Nevertheless, broader stocks of knowledge developed in societies over generations take more than a global pandemic to fully erode. Measures of average years of education in a society change slowly, and prior to COVID-19 is projected that the average years of education for someone 15 or older would grow from 6.2 years in 2019 to 6.9 years by 2030, 7.5 years by 2040, and 8.2 years by 2050. The effect of COVID-19 is to reduce that by between 0.005 and 0.09 years relative to a *Pre-COVID Base* scenario. The overall reduction is greater further in the future.

Other systems of health and well-being will be negatively impacted by the virus as well, with systems of undernutrition being particularly vulnerable. In the section on identifying vulnerable populations to envision systems of resilience, the study highlights countries vulnerable to disproportionately large COVID-19 impacts driven by heavy dependence on food imports. The study estimates that the effect of COVID-19 would be to increase the undernourished population by tens of millions across time, with an additional 10 million people living with undernutrition by 2030 and 20 million by 2040.

The effect of all these changes is to increase the number of people in Africa living in extreme poverty (on less than USD1.90 per day in 2011 at purchasing power parity) by 22 million people by 2021, 38 million people by 2030, 52 million people by 2040, and 39.5 million people by 2050 – *Figure 12*. This represents a moderate percentage point increase in the number of people of 1.6 by 2021, 2.2 by 2030, 2.4 by 2040, and 1.5 by 2050 compared with a *Pre-COVID* scenario.

Figure 12: Millions of people in Africa in poverty (under 1.90 USD per day)



TECHNOLOGY AND NATURAL SYSTEMS

The effect of reductions in economic production can be to reduce human-induced stress on natural systems and to reduce investments and consumption of new technologies. But, while there have been early indications that the economic reduction induced by COVID-19 has reduced carbon emissions and fossil fuel use, all scenarios assessed in this report suggest that those effects are short-term. The growing effects of climate change and the diffusion of technology will continue, though with some different characteristics.

Global temperature change is directly impacted by the slow-down in emissions driven by slower economic growth in 2020. But long-term changes in global emission patterns will also be impacted by slowdowns in investment in renewable energy, a shift that is also driven by the reduction in economic activity in 2020. We estimate that the global impact of reductions in economic activity will reduce investment in renewable energy compared with a *Pre-COVID Base* by between 3-6 percent across time. However, while there is a reduction in investment relative to a *Pre-COVID Base*, overall growth in renewable energy is expected to continue, with non-hydro related renewable energy doubling in a *COVID Base* scenario by 2026, then doubling again by 2032.

Other technology related trends such as access to mobile telephones or smart phones are also expected to continue. For example, the study projects a slight reduction in mobile broadband access on the continent in 2030 of less than 1.2 percent relative to a *Pre-COVID Base*. In both scenarios access to mobile communication technology continues to grow dramatically.

GOVERNANCE

In *Africa's Path to 2063: Choice in the Face of Great Transformation*, the most important development policy choice that influencing the continent's economic growth and development trajectories emphasized the importance of the quality and capability of governance systems.

Governance systems are particularly vulnerable to erosion as the long-term effects of the COVID-19 pandemic are felt. Models that predict the possibility of violent conflict are "flashing red" as significant reductions in economic growth are felt across the continent and the world. The vulnerable populations highlighted above need to be cared for not only because it is the duty of governments but also because inclusive and capable governance can mitigate long-standing grievances and help to produce a lasting and stable development context in pursuit of Agenda 2063.

DETERMINING POLICY IN RESPONDING TO COVID-19 WITHIN AN AGENDA 2063 DEVELOPMENT CONTEXTS

THE ANALYTICAL AND DECISION-MAKING SCOPE

COVID-19 has put a spotlight on systemic development weaknesses and fragilities, along with compelling accelerated shifts toward a more systems-thinking and integrated approaches to development – across sectors, disciplines, and nations. Further, public policy and government service delivery particularly the capacity to provide for the immediate needs of the people, simultaneously building resilient and inclusive socio-economic systems is drawing public attention. The populations are looking up to their governments for leadership and guidance on how to navigate the COVID-19 pandemic and related socio-economic shocks. This section, presents some policy guidelines that governments could draw on as they navigate this largely unknown and unforeseen situation.

Responding to the COVID-19 pandemic and its associated socio-economic shocks has elevated the significance of public-private partnerships at all levels and across different sectors. Indeed, as Africa battles coronavirus, there is a general recognition that it is not the responsibility of government alone, but the private sector and civil society are equally responsible and important players. Nonetheless, responding and managing the current pandemic and related socio-economic consequences involves decisions and actions that government leadership cannot abrogate. Connecting to Africa's development ambitions (Agenda 2063), there is increasing recognition that the COVID-19 pandemic has unleashed unprecedented socio-economic shocks. As such, countries and societies must respond and act rapidly, and decisively even when many of the pieces remain in motion with lots of unknowns and uncertainties. What is increasingly obvious is that countries will need to be open to taking unprecedented policy choices. It is more than mere 'fight-back' strategies, rather strategic policies and measures informed by integrated frameworks such as the systems maps discussed in this report that will help us emerge from the pandemic stronger and more resilient.

Drawing on key findings from this study, the report presents a framing of decision-making guidelines to help governments in their efforts to determine economic growth and development policy choices in responding to and managing COVID-19 disruptions. While, COVID-19 is still a largely evolving crisis, the study has identified four overarching factors in Africa's economic growth and development trajectories. The key findings, summarised in *Table 4* below confirm that COVID-19 can adversely and, in some cases, severely impact the continent's development course. These include, reducing Africa's per capita production by almost USD300 in 2020 and setting back development by ten years.

The following overarching principles are identified to guide application of the decision making framework in determining appropriate development policy choices:

- Key imperatives in public policy responses are:
  a. Balancing between 'saving lives' and 'saving livelihood interventions',
  b. Paying attention to and being deliberate on immediate vs. medium long-term needs including strengthening resilience in member states to handle shocks of this nature in future and,
  c. Managing associated trade-offs.
- While the shock is triggered by the evolving healthcare crisis, it is already apparent that COVID-19 is a development, and not just a healthcare concern.
- COVID-19 has evoked unprecedented socio-economic disruptions, measures to respond to the pandemic should not be treated as mere fighting back procedure, rather an opportunity to re-examine existing development policies, strategies, and tools with evidence-based understanding of systemic development challenges, local circumstances, and priorities as well as capacities to drive transformative and inclusive development.
- The inter-connectedness and inter-dependences (thematically and geographically across multiple layers) in the impacts of COVID-19 make a strong case for fact-based systems thinking policy determination and implementation tools. Critical in this regard are also trans-national and regional solutions.

Table 4: Some key development factors expected to be impacted by COVID-19

Expected COVID-19 impacted factors	Associated core variables
Reduced GDP and compressed government fiscus	In the COVID-19 Base Scenario GDP is reduced by USD1.2 trillion by 2025 and nearly USD20 trillion by 2050 compared with the Pre-COVID Base • Through to 2063, the impacts of COVID-19 could cost Africa nearly USD20 trillion in **economic production** and **consumption losses**; i.e. over seven times Africa's total economic output for 2019 • Reduced **economic output** in 2020 by USD192 billion (best- and worst-case Scenarios of UDS150 to - USD234 billion in 2020) • **Cumulative Economic costs** will grow significantly in a *COVID-19 Base* world: USD2.8 trillion by 2030, USD8.9 trillion by 2040 and USD19.9 trillion by 2050 (exceed USD37 trillion by 2050 in pessimistic scenarios) • Reduction in future share of economic activity associated with services by about 1% point while increasing the role of agriculture and energy • GDP per capita returning to 2019 levels by 2024 (a five year "set-back"). In a worst-case scenario, a ten-year set-back in development Effect of COVID-19 on government revenue will be catastrophic • Comparing Pre-COVID-19 Base with COVID-19 Base, overall cumulative govt revenue reduction is USD761 billion by 2030, USD2,270 billion by 2040, and USD5,145 billion by 2050 (In 2019, Africa's total government revenue estimated to be USD691 billion) • In the long term, changing patterns of govt revenue are expected to significantly reduce spending on education, health, infrastructure, and the military
Adversely impact intra-African and inter-African trade	Africa's exports as percentage of GDP dipping by about 2 percentage points below the projected 2020 figure of 23.9% • For instance, Intra trade volumes in East African Community region have dropped to between 30% and 40% in the period April to June 2020 • Supply chain disruptions will heavily impact countries reliant on outside states that experience significant disruptions. • At only 19% of its exports in 2018 traded within the continent (compared to 69% in Europe and 59% in Asia), AU's projected increase in intra-Africa trade to about 60% by 2022 could be adversely derailed by COVID-19
Increased poverty, inequality and food insecurity	• Increase in number of people living in extreme poverty in Africa by 22 million over the next two years (2020-2022) and by nearly 50 million people by 2035 • Disruption of COVID-19 to global supply chains and likely speculative increases in food prices risks precipitating food security crises. Heavy dependence on food imports is a key element of vulnerability in this regard - leading to an additional 10 million people living with undernutrition by 2030; 20 million by 2040 as a result of COVID-19 • Job losses, disruptions to informal trade will constrain access to incomes for large sections of the continent's populations. Reduced household incomes and falling into poverty

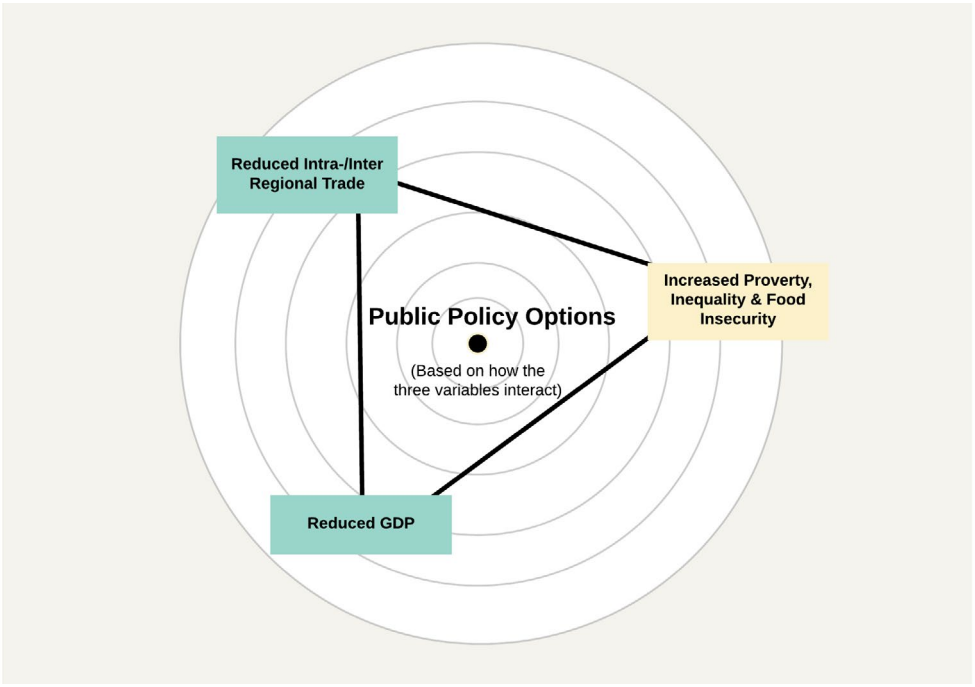
DETERMINING PUBLIC POLICY CHOICES WITHIN LOCAL CONTEXTS

The study identifies a three-point decision-making framework, outlined in Figure 13, to guide evidence-based public policy choices. The framework is meant to ensure government integration of comprehensive policies and strategies that reflect local responses to the consequences of COVID-19. In doing so, governments will be empowered to handle future socio-economic shocks in a multifaceted, dynamic and complex nexus.

The form and character of the nexus will vary over time and from country to country (from circumstance to circumstance). Within a systems-thinking context, reflecting on the change induced by COVID-19 on the three variables and associated sub-variables, the triangle provides a model to help governments bring the interactions of the key variables into perspective.

This analytical framework can help in determining policy choices that are informed by a broad and integrated set of factors. Policy choices would be either entirely new direction/s or consolidating (alignment, harmonization and coherence) of existing policies or policy decisions to support and foster actions already undertaken to ensure the necessary environment to move changes into critical mass. Additionally, the analysis will help Government identify the trade-offs and risks associated with selected policy options – first step to ensuring that such trade-offs are also planned.

Figure 13: Integrated approach in determining public policy choices in responding to COVID-19



COVID-19 is an opportunity for Africa to transform how development works and to embrace inclusive sustainable growth while managing economic interdependence within Africa and with the rest of the world. COVID-19 has presented a strong case on the urgency of the AfCFTA and Industrial growth. Finally, it is important to recognise that Economic damage may not be driven only by domestic policies, but also by patterns of international economic interdependence, making countries heavily dependent on international trade more vulnerable

CONCLUSION

COVID-19 did not originate in Africa—first cases were only reported about two to three months after the virus was noted in China and at the time already widespread in Asia, Europe, and the Americas. The spread of the virus was widely, across the continent, met with immediate aggressive responses aimed at slowing down or better still halting its spread (flattening the curve). As with the rest of the world, the expectation was that such measures would buy the countries some time to prepare the healthcare capacities. Unfortunately, such healthcare measures, largely, in the form of lockdowns (businesses and industries closed; travel restricted including borders closures) resulted in massive and costly disruptions on the socio-economic front - the consequences most felt in poorer sections of the communities. The next stage of government response must build upon the first response and shape it thoughtfully with an eye towards vulnerable populations and future sustainable and inclusive development.

It is possible for member states to weather this storm and emerge on the other side with a strategy for further continental integration, managed interdependence with the rest of the world, and further integration to overcome structural inequalities stemming from historical injustices like colonialism. The "Africa we want" is a peaceful and inclusive continent of free-thinkers and innovators, engaged and motivated by a shared identity and vision for an emancipated present and future. COVID-19 presents an opportunity to further articulate an inclusive vision for African development that is characterized by sustainability, inclusive policies, and economic development.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